Adverse health consequences of and risks associated with new psychoactive substances

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Presentation

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New Psychoactive Substances (NPS)

- Emerging substances mimicking other substances under national or international control.

- Aspects to be considered in a Health perspective:

- ✓ Prevalence: 1004 NPS have been reported to the UNODC Early Warning Advisory (EWA).
- ✓ Availability: trafficking, smuggling, chemical synthesis, internet sales.
- ✓ Vulnerable populations affected.
- ✓ Limited scientific evidence (e.g. abuse/dependence potential).
- ✓ Known toxic effects and health adverse consequences, including fatal intoxications.
- ✓ Related risks: cognitive and psychomotor effects leading to impaired driving, sexual risk behaviour.
- ✓ Route of administration (form of consumption).
- ✓ Dosage unknown, adulterations, substitutions.
- ✓ Polysubstance use (NPS and other drugs).
- ✓ Laboratory analytical capacities for identification **in clinical settings.**
- ✓ COVID-19 pandemic.

New Psychoactive Substances (NPS)

NPS groups	
Phenethylamines (stimulants, hallucinogens)	Amphetamine-type stimulants Synthetic cathinones “2C” series DOI, DOC, DOM.
Phencyclidine-type substances (dissociatives)	Ketamine, phencyclidine (PCP)
Piperazines	Benzylpiperazine (BZP), 1-(3-chlorophenyl) piperazine (mCPP).
Synthetic cannabinoids (SCRA)	JWH-018, JWH-073, APINACA
Opioids	Fentanyl and analogues, U-47700, AH-7921.
Benzodiazepines (sedatives)	Etizolam, flualprazolam
Plant based substances	Khat, Kratom, Salvia divinorum
Others groups: aminoindanes, triptamines.	

NPS groups	Acute toxicity - intoxications
Phenethylamines (stimulants, hallucinogens)	Serotoninergic effects (serotoninergic syndrome and complications) Sympathetic stimulation (cardiovascular, neurological complications) Neuropsychiatric effects Rhabdomyolysis, acute renal injury. Hyponatremia
Synthetic cannabinoids (SCRA)	Nausea, vomiting, Neuropsychiatric effects (agitation, confusion, violent behaviour, psychosis, seizures) Tachycardia, arterial hypertension. Hypoglicemia, hypokaliemia.
Opioids	Coma, miosis, respiratory depression Pulmonary edema Bradycardia, hypotension, hypothermia.

- **Polysubstance use:** limitation in clinical diagnosis, increase acute toxicity.

✓ stimulants, stimulants/depressants, depressants, stimulants/depressants/dissociatives.

- Chronic use: neuropsychiatric effects (cognitive impairment, parkinsonism, psychosis), respiratory diseases (smoked substances), higher prevalence of HIV, hepatitis C (intravenous route + risk behaviour).

Early warning system (Uruguay) - Database

- Information found by form/presentation or substances found.
- Source: Seizures analized by Scientic Police, Forensic Technical Institute (FTI), Faculty of Chemistry.
- Clinical cases from the Montevideo PCC.
- Toxicological information included.
- Trends: adulterations/substitutions and forms with high concentrations of the psychoactive substance (MDMA - ecstasy forms).
- Scenario of consumption: majority in rave and electronic music festivals.

Forms	Susbtances found
Tablets (ecstasy, pills)	MDMA, methylcathinone, LSD, 2 C-B, MDA, clobenzorex, ethylpenthylone.
Cristals, powder	MDMA, ketamine, heroin, DOC.
Blotters	LSD, fentanyl, NBOMe, DOC, DOB, DOI, 2 C-B, 2 C-E, MDMA, ketamina

Uruguayan Drug Observatory, National Drug Board

Actions taken in clinical settings
Public alert

- FTI analysis of 575 ¨LSD blotters¨ in May 2017

- Drug detected: fentanyl

- Public health intervention:

✓ Public alert

✓ Toxicovigilance (Poison Control Center)

✓ Naloxone availability in medical services (including primary care level).

Other substances detected in urine analysis Rave and electronic music festivals (Uruguay, 2016-2019)

- SCRA: JWH-248, JWH-208 (GC/MS).
- SCRA: UR-144/XLR-11, UR-144, XLR-11, A-834735 (ELISA).
- Synthetic cathinones: mephedrone, methedrone, methylone, buphedrone, 4-fluoromethcathinone, 3-fluoromethcathinone, methcathinone (ELISA).
- Fentanyl (ELISA).

Umpierrez E et al, 2019.
Environment, Drugs and Doping Unit Pando Polo Technological Institute. Faculty of Chemistry
Uruguayan Drug Observatory, National Board of Drugs.

New Psychoactive Substances (NPS)

- Emerging threat: current high prevalence of use/abuse.

- Health adverse consequences:

✓ Acute toxicity (including lethal overdose)
✓ Chronic effects (substances involved, form of consumption)
✓ Polysubstance use (increase toxicity, limitations in clinical diagnosis)
✓ Related risks (increase mortality)

- Clinical settings in several countries:

- Imnunoessays (most of NPS not detectable)
- Limitations to access to standard analytical methods (GC/MS).
- Clinical presentation + drug screening

- Trends differ between regions and countries: data from regional and national EWS and other sources of scientific information (based on ¨work field¨) significantly contribute to clinitians in the diagnosis and treatment.